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Notice of Allowability	Application No.	Applicant(s)	
	10/649,663	SHIMOZONO ET AL.	
	Examiner	Art Unit	
	Cynthia L. Davis	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address-- .
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1/24/2006.
2. ☒ The allowed claim(s) is/are 1-3 and 7-8, renumbered as 1-5, respectively.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |


CHAU NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with John Mattingly on 2/13/2006.

1. (Currently Amended) A virtualization switch being connected with a plurality of storage units and a computer, said switch being connected with said storage units through a plurality of communication paths, comprising:

a plurality of interfaces being connected with said storage units or said computer;
and

an internal switch for connecting said plurality of interfaces with one another;

a management table having information about a virtual logical unit number (virtual LUN) of a virtual storage, a LUN, a first communication path of said communication paths, a second communication path of said communication paths, and a data transfer starting information of a command, said virtual LUN being used to virtually represent a position of said LUN in said storage units for said computer and relay a command, sent from said computer to said virtual LUN, to said LUN, said first communication path being used if trouble does not occur in said first communication path and said second communication path being used if trouble occurs in said first

communication path;

wherein a first interface of said plurality of interfaces receives a command for data transfer from said computer to said virtual storage, records an identifier for identifying said command, transfers said command to said LUN in said storage units through a first communication path of said plurality of communication paths based on said management table, detects, in response to said command, a trouble occurring in said first communication path, records a starting of said data transfer upon said command with said recorded identifier, transmits, if a starting of a data transfer has been recorded, a frame for noticing an error of said received command to said computer if starting of said data transfer has not been recorded, creates a new data transfer upon said command by using said LUN corresponding to said virtual LUN without transmitting said frame for noticing said error and transfers a command to said LUN in said storage units through said second communication path.

2. (Currently Amended) A virtualization switch as claimed in claim 1, wherein said first interface determines a trouble occurs in said first communication path if no response to said command having been transmitted to said storage units is received a certain length of time later.

3. (Currently Amended) A virtualization switch as claimed in claim 1, wherein said first interface detects a trouble occurring in said first communication path by determining a cut-out of a physical connection with said storage units.

4-6 (Canceled)

7. (Currently Amended) A virtualization switch as claimed in claim 1, wherein said

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first interface provides said computer with a virtual storage and, if a command from said computer to said virtual storage is received, translates said command to said virtual storage into a command to said storage units.

8. (Currently Amended) A method of transferring a frame in a virtualization switch connected with a plurality of storage units and a computer through a plurality of communication paths, comprising the steps of:

managing, in a management table, information about a virtual logical unit number (virtual LUN) of a virtual storage, a LUN, a first communication path of said communication paths, a second communication path of said communication paths, and a data transfer starting information of a command, said virtual LUN being used to virtually represent a position of said LUN in said storage units for said computer and relay a command, sent from said computer to said virtual LUN, to said LUN, said first communication path being used if trouble does not occur in said first communication path and said second communication path being used if trouble occurs in said first communication path;

receiving a command for data transfer from said computer to said virtual storage, recording an identifier for indicating said received command, then transferring said command to said LUN in said storage units through a first communication path of said plurality of communication paths based on said management table;

detecting, in response to said command, a trouble occurring in said first communication path;

recording a starting of said data transfer upon said command with said recorded

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identifier;

transmitting, if a starting of said data transfer has been recorded, a frame for noticing an error of said received command to said computer if starting of said data transfer has not been recorded; and

creating a new data transfer upon said command by using said LUN corresponding to said virtual LUN without transmitting said frame for noticing said error, and transferring into said LUN in said storage units a command to be received from said computer through a second communication path of said plurality of communication paths.

9-10 (Canceled)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L. Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLD

2/13/2006

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2/13/06